

relation to those particles which are leaving the substance under operation.

274. The theory accounts for the *transfer of elements* in a manner which seems to me at present to leave nothing unexplained; and it was, indeed; the phenomena of transfer in the numerous cases of decomposition of bodies rendered fluid by heat (116, 138); which, in conjunction with the experiments in air, led to its construction/ Such cases as the former where binary compounds of easy decomposability are acted upon, are perhaps the best to illustrate the theory.

275. Chloride of lead, for instance, fused in a bent tube (136)[^] and decomposed by platina wires, evolves lead, passing to what is usually called the negative pole, and chlorine, which being evolved at the positive pole, is in part set free, and in part combines with the platina. The chloride of platina formed, being soluble in the chloride of lead, is subject to decomposition, and the platina itself is gradually transferred across the decomposing matter, and found with the lead at the negative pole.

276. Iodide of lead evolves abundance of lead at the negative pole, and abundance of iodine at the positive pole.

277. Chloride of silver furnishes a beautiful instance, especially when decomposed by silver wire poles. Upon fusing a portion of it on a piece of glass, and bringing the poles into contact with it, there is abundance of silver evolved at the negative pole, and an equal abundance absorbed at the positive pole, for no chlorine is set free: and by careful management, the negative wire may be withdrawn from the fused globule as the silver is reduced there, the latter serving as the continuation of the pole, until a wire or thread of revived silver, five or six inches in length, is produced; at the same time the silver at the positive pole is as rapidly dissolved by the chlorine, which seizes upon it, so that the wire has to be continually advanced as it is melted away. The whole experiment includes the action of only two elements, silver and chlorine, and illustrates in a beautiful manner their progress in opposite directions, parallel to the electric current, which is for the time giving a uniform general direction to their mutual affinities (260).

278. According to my theory, an element or a substance not

decomposable under the circumstances
of the experiment (as,
for instance, a dilute acid or alkali)
should not be transferred,
or pass from pole to pole, unless it be in
chemical relation to
some other element or substance tending
to pass in the opposite
direction, for the effect is considered as
essentially due to the